



HAB data collection in Texas

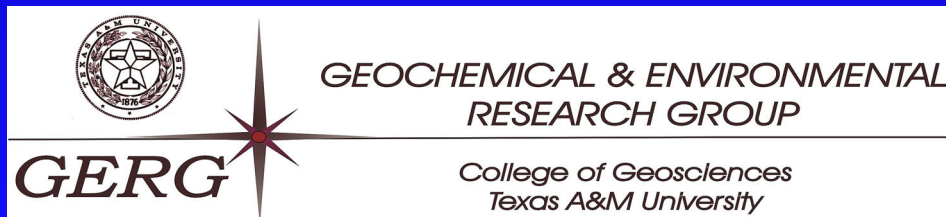


Tracy A. Villareal

Marine Science Institute

The University of Texas at Austin

750 Channel View Dr., Pt. Aransas, Texas 78373



Monitoring in Texas

- Efforts relatively recent
- Bloom of 1986 was large and killed 10's of millions of fish
- Changed awareness of red tides, many previous events were likely unrecorded or misidentified

Monitoring- State efforts

- Texas Dept. of Health (previous talk by K. Wiles) shellfish resource monitoring
- Response to fish kills by Texas Parks and Wildlife
- There is no regular monitoring of cell counts by State agencies

TPWD response

- Actively respond to reports of discolored water and dead fish
- Fish kills trigger the response
- Estimate numbers and species of the dead fish
- Determine the cause, if possible, and identify if a red tide was responsible



TPWD response



Identifications done
conjunction with local
academic or state
personnel

State database records
numbers and cause of
kills

Counts generally not
recorded by TPWD

For coast-wide blooms,
aerial surveys are used to
track blooms

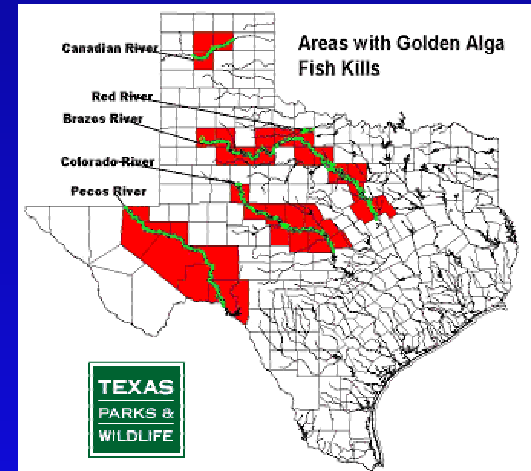
Texas Parks and Wildlife:

Maintains websites on
Red tide:

<http://www.tpwd.state.tx.us/fish/recreat/tideup.htm>

Golden algae (*Prymnesium parvum*):

<http://www.tpwd.state.tx.us/news/news/algae/index.phtml>



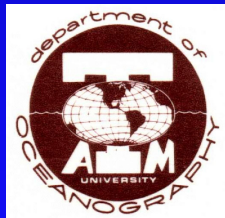
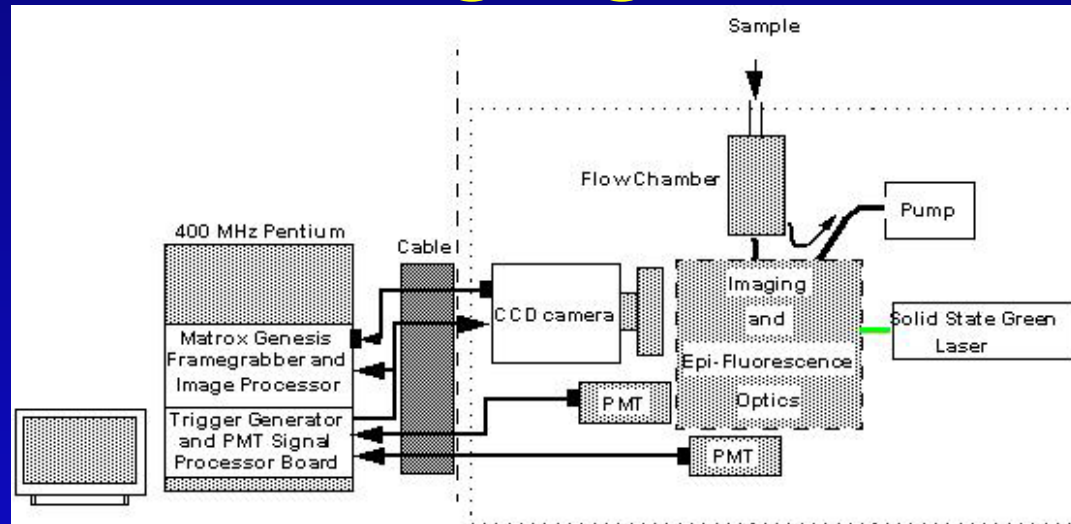
Sponsors the TEXHAB committee, a multiagency committee meeting quarterly to discuss HAB issues, includes state and academic representation

K. Brevis monitoring effort- Academic

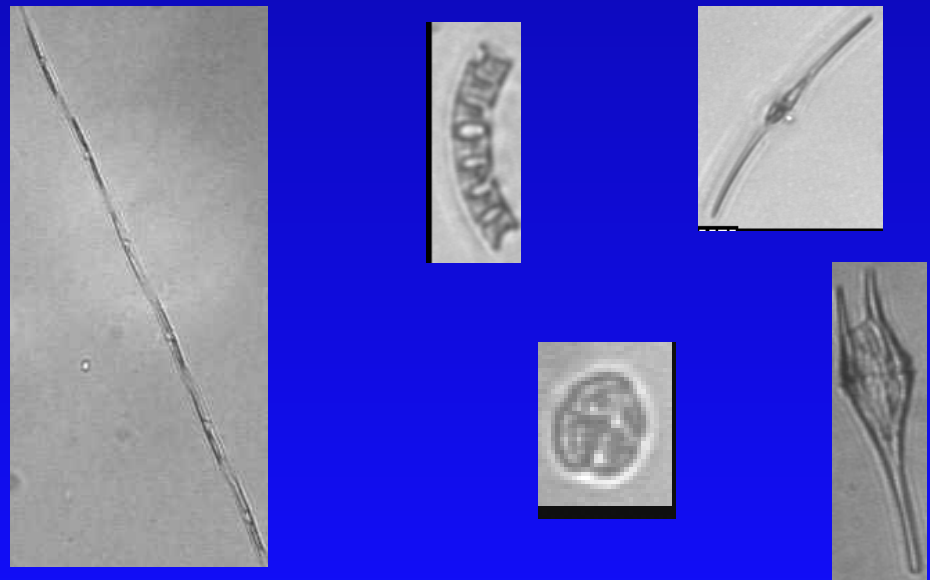
- Texas A&M MERHAB project under development, not currently deployed (Campbell and Guinasso)
- Univ. of Texas project is funded by MERHAB (NOAA), and is of limited duration (3 years; Villareal, Stumpf and Aikman).
- Other event-driven sampling may occur, but are not organized and have no common data base to record the data.

FlowCAM: *in situ* imaging

Sea water is pumped through a flow cell, illuminated with a laser, and a digital camera captures and record images of individual cells for both immediate transmittal back to shore via cell phone and for archival. *K. brevis* has a characteristic shape and should be easily recognized by the optics system.

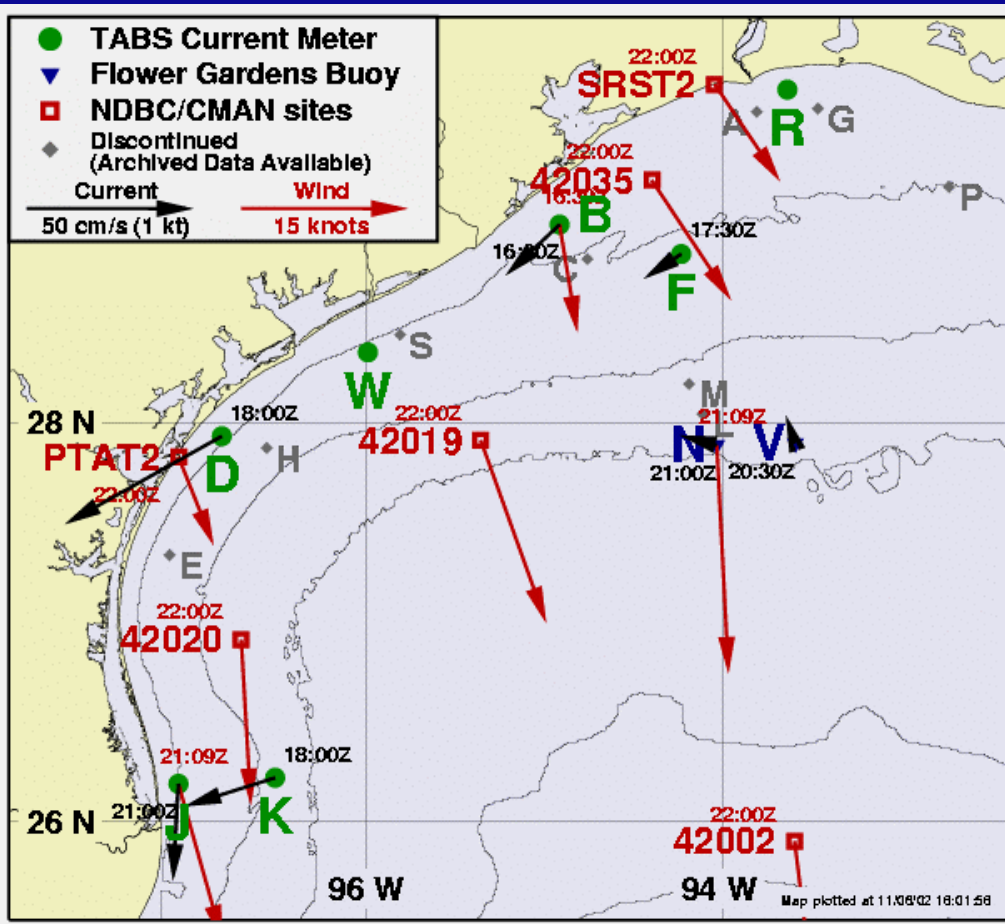


Slide courtesy of Lisa Campbell



Texas Automated Buoy System

(<http://tabs.gerg.tamu.edu/Tglo/>)



Flow cam will be deployed on a buoy along with nutrient and oxygen sensors. This will be part of new TABS buoy. Ideally will provide real time cell counts.

Univ. of Texas at Austin

Satellite detection and monitoring of *K. brevis* blooms in the western Gulf of Mexico

Requires validation of cell count and chlorophyll algorithms along the Texas coast

Experimental HAB bulletin



Experimental Gulf of Mexico Harmful Algal Bloom Bulletin

2 June 2003
National Ocean Service/NCCOS and CSC
NESDIS/CoastWatch and NDBC
Last bulletin: May 20, 2003

Analysis

SW Florida:

Chlorophyll imagery suggests that the *K. brevis* bloom at Sarasota has extended southward to Venice. Persistent northerly winds since May 25 are responsible for southward transport of the bloom. Chlorophyll concentrations remain above 3 ug/L in the area. The state reports higher than normal cell counts in Manatee and Sarasota counties.

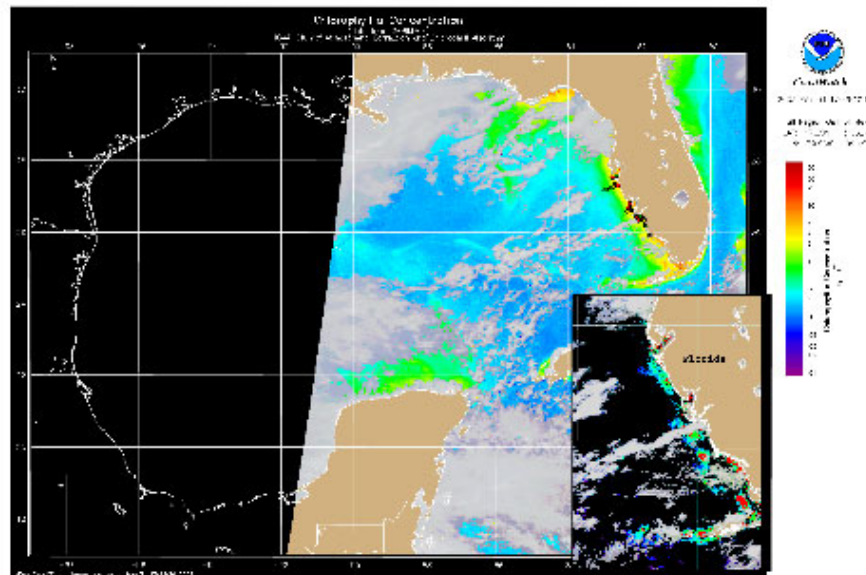
An offshore flag, which could contain *K. brevis*, is observed off Sanibel and extends offshore from 92d23'W 26d30'N to 82d4'W 26d8'N. Although onshore cell counts indicate that *K. brevis* is not present, this area should be monitored as predicted southerly winds could cause northward transport towards Sanibel.

An offshore flag is also observed 10-20 km west of Cape Romano and should be monitored as it may contain *K. brevis* cells.

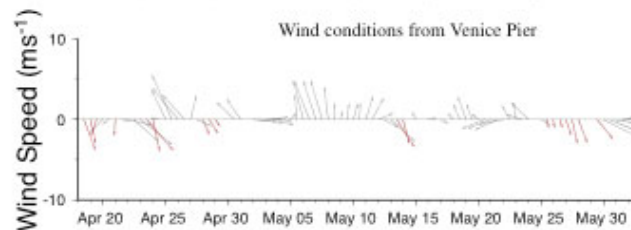
-Tomlinson

Please note the following restrictions on all SeaWiFS imagery derived from CoastWatch.

1. These data are restricted to civil marine applications only; i.e. federal, state, and local government use/distribution is permitted.
2. Distribution for military, international, or commercial purposes is NOT permitted.
3. There are restrictions on Internet/Web/public posting of these data.
4. Image products may be published in newspapers. Any other publishing arrangements must receive OrbImage approval via the CoastWatch Program.



Chlorophyll concentration (above) and possible HAB areas shown in red (inset). Cell concentration sampling data from May 28, 2003 shown as red squares (high), red triangles (medium), red circles (low), orange circles (very low b), yellow circles (very low a), green circles (present), and black "X" (not present).

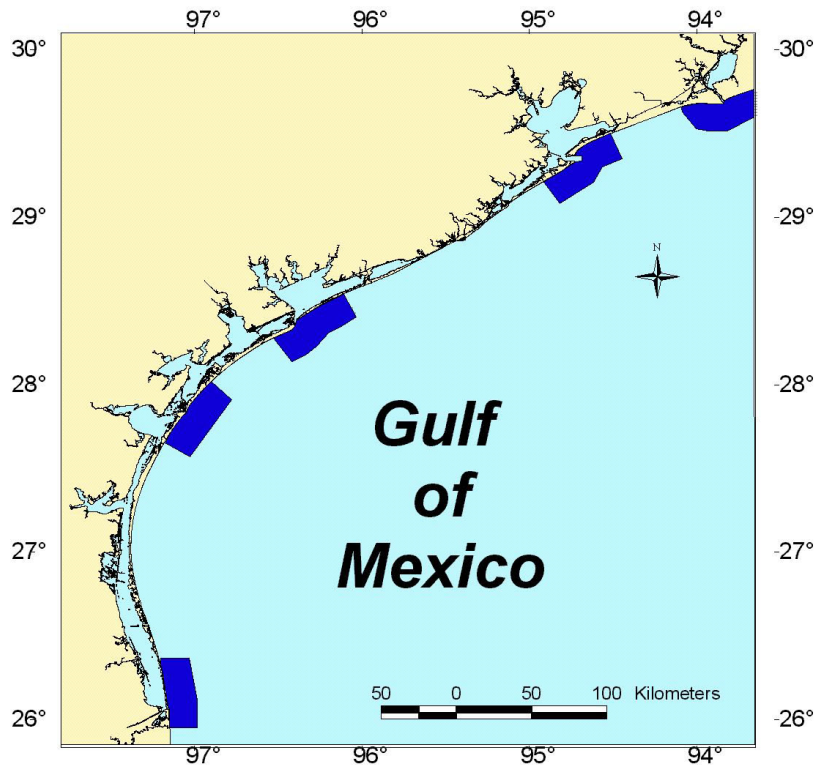


Wind speed and direction are averaged over 12 hours from measurements made on NOAA buoys. Length of line indicates speed; angle indicates direction. Red indicates that the wind direction favors upwelling near the coast.

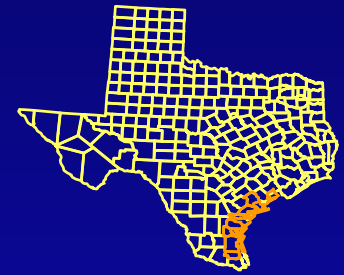
Southwesterly winds are expected to turn southerly by this evening. Southerly winds are predicted to continue through Tuesday night and turn southeasterly by Wednesday.

Result: Extension of the NOAA HAB bulletin to Texas, possibly the western Gulf of Mexico

Gulf Sample Sites



Sampling is an ancillary program



Uses regular finfish survey cruises by Coastal Fisheries Division, Texas Parks and Wildlife

Bimonthly collections at 5 sites

Samples are collected, preserved and returned to UTMSI for evaluation

Types of data

- Preserved cell counts (settled volume 10-50 ml)
- Chlorophyll
- Nutrients (nitrate+nitrite, ammonium, phosphate, silicate)
- Temperature, salinity, dissolved oxygen

Data access

- Recent developments in the Gulf of Mexico pilot project create opportunities with the NCDDC to be a data focal point
- Provide rapid presentation of cell count data on a common platform for investigators and managers along the Texas coast.



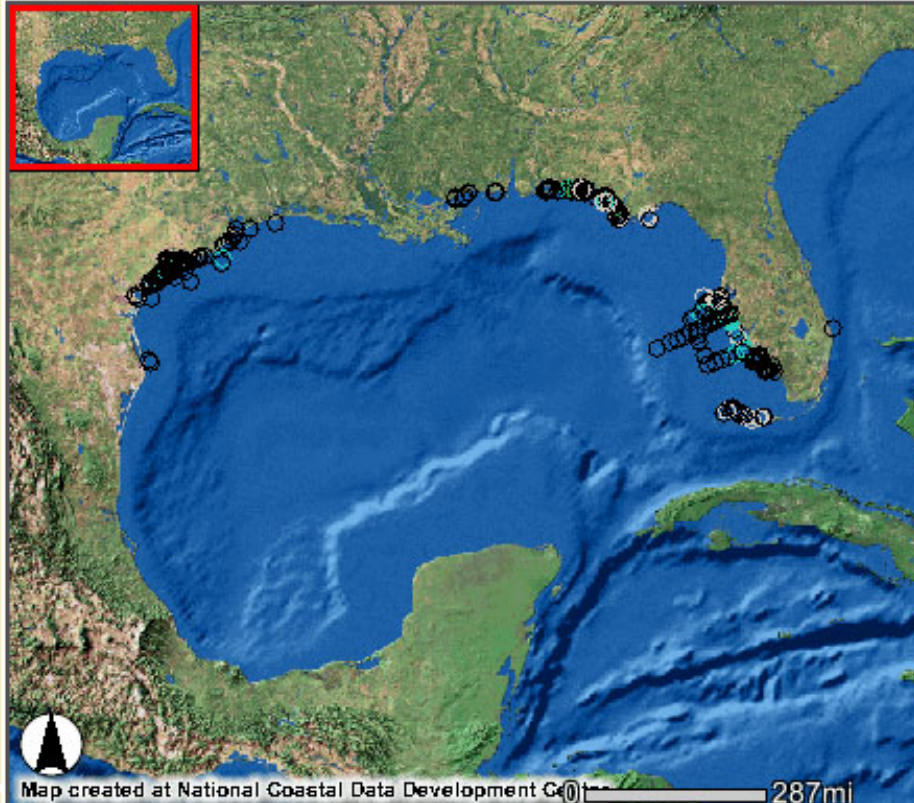
HABSOS - Harmful Algal Blooms Observing System

[Help](#)

Legend Toggle Zoom In Zoom Out Full Extent Active Last Pan Identify Clear Print

GOM Cell Counts

- ☐ Not Present
- ☐ Present
- ☐ Very Low A
- ☐ Very Low B
- ☐ Low
- ☐ Medium
- ☐ High
- ☐ Relief Image



[Texas](#) [Louisiana](#) [Mississippi](#) [Alabama](#) [Florida](#)

[Refresh](#)

Query Functions

Begin Year

2000

End Year

2000

Begin Month

November

End Month

November

Begin Day

1

End Day

30

Salinity (ppt)

>=

Temperature (C)

>=

[Submit](#)

[Add it](#)

[Delete it](#)

☐ SST

☒ Chlorophyll

[|<<](#) [<<](#) [Date](#) [>>](#) [>>|](#)

Gulf of Mexico pilot project: Can we incorporate data into a meaningful presentation

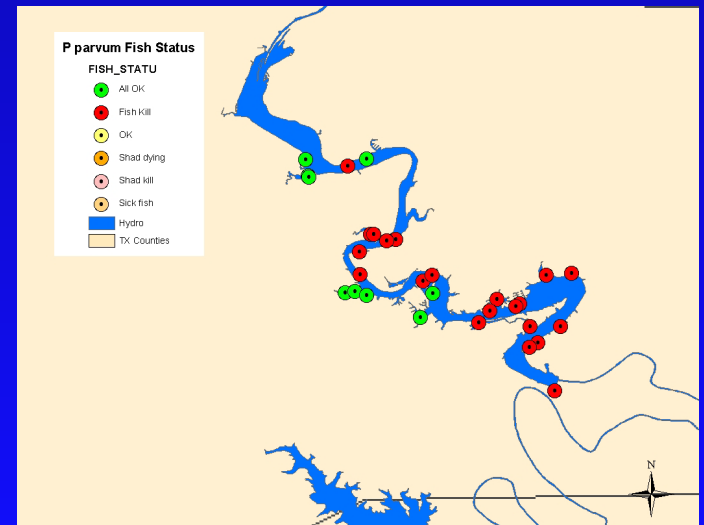
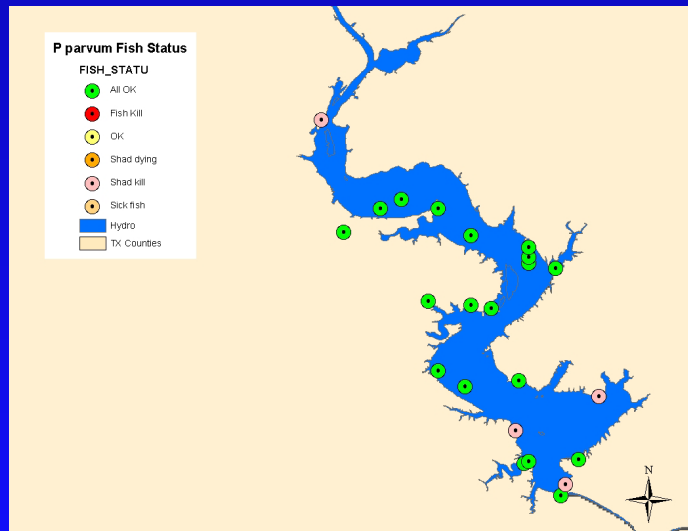
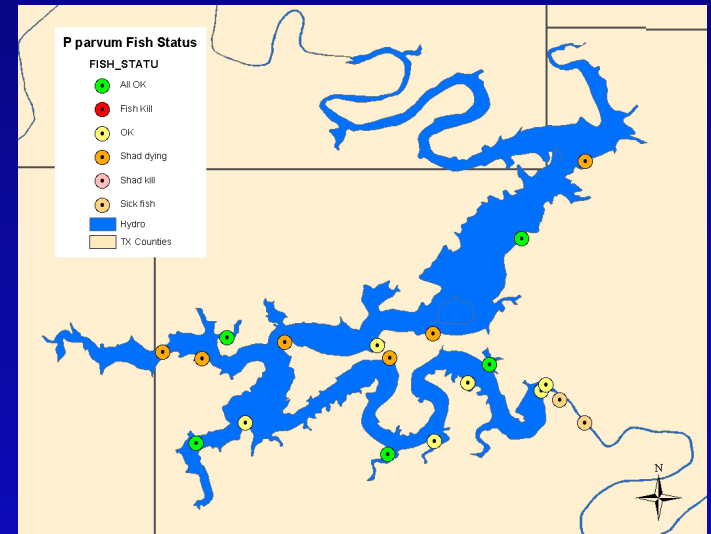
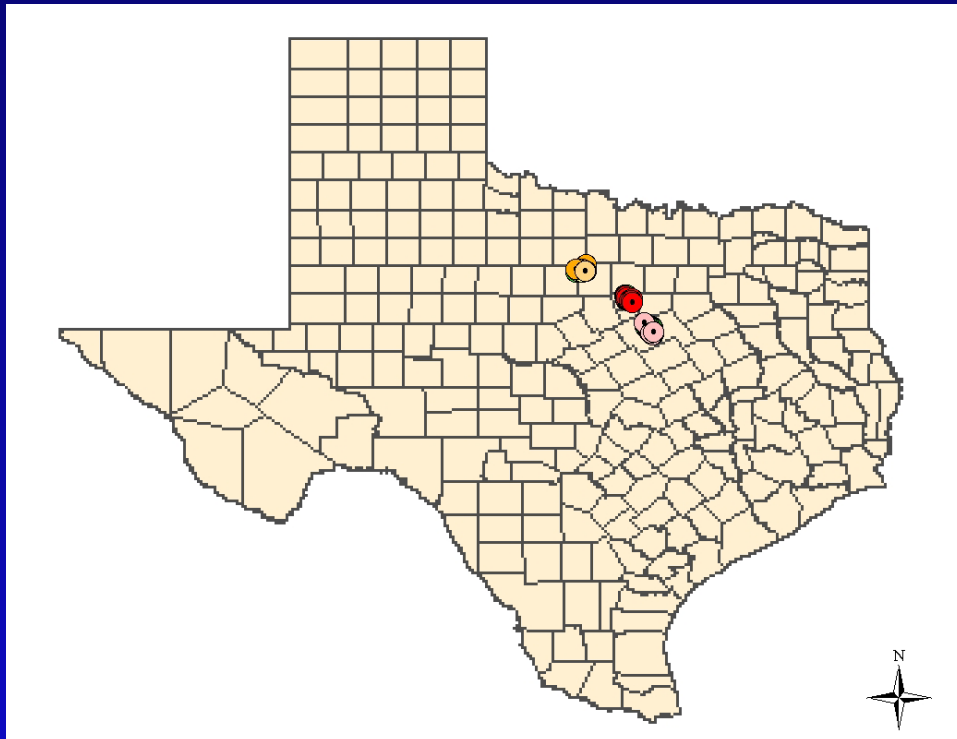
Data presentation

Data entry tools are being developed to allow user-friendly entry in a convenient format

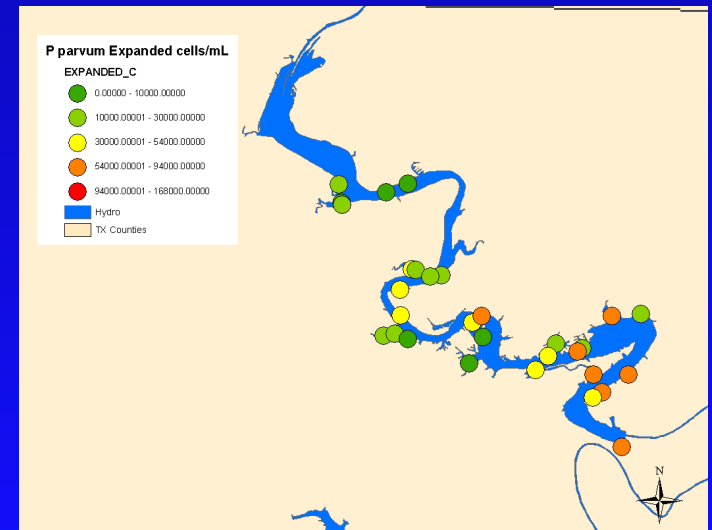
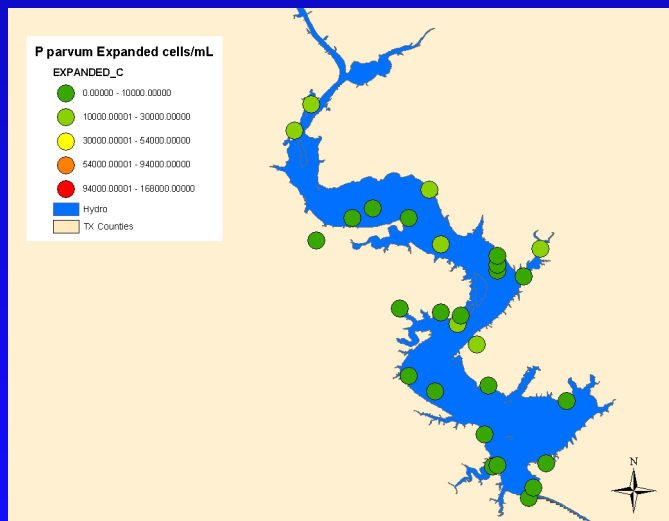
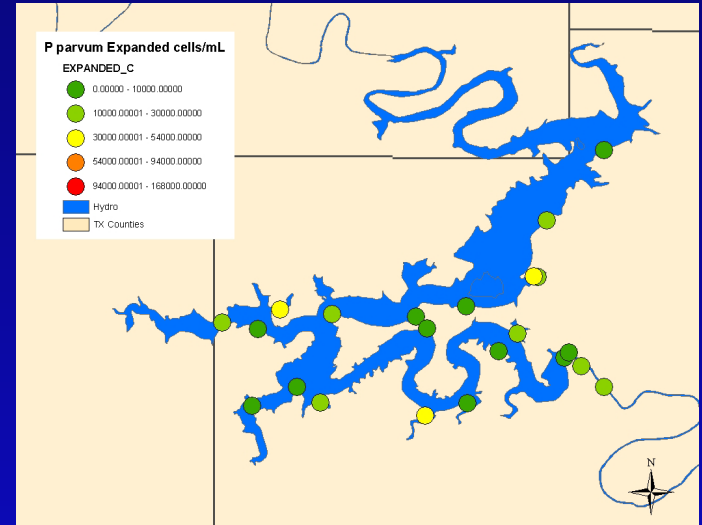
Either web based or uploadable file

Interest in Texas for using the system for *Karenia brevis* (UT) and *Prymnesium parvum* events (TPWD), as well as a research-oriented program on ciguatera (UT)

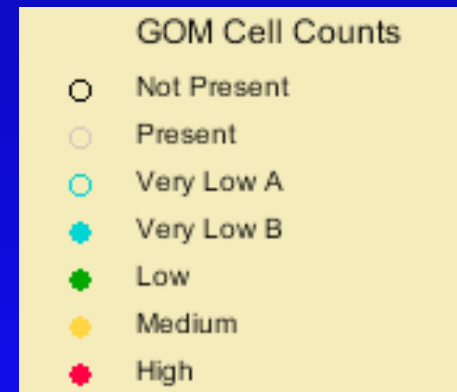
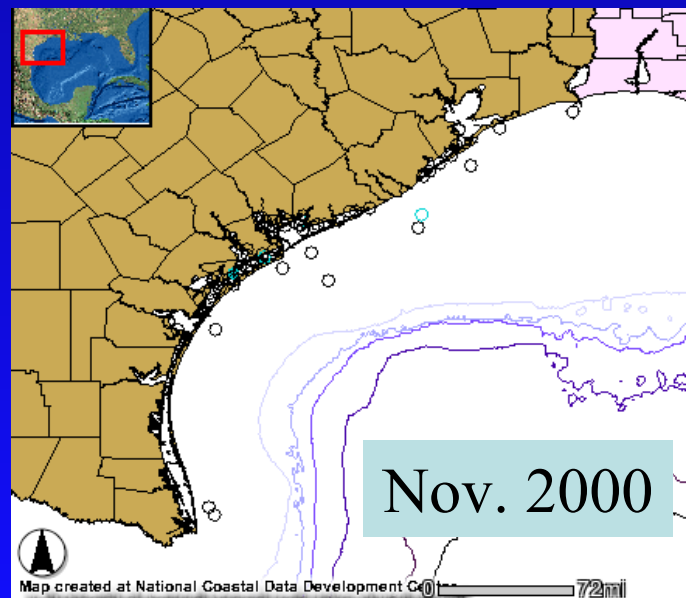
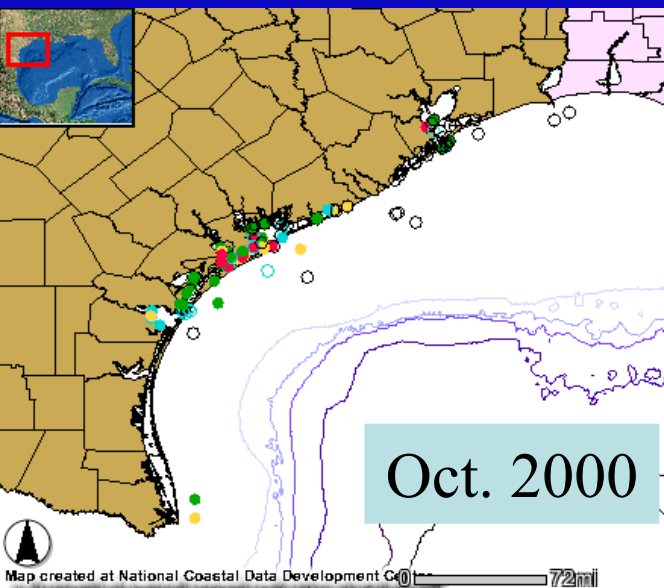
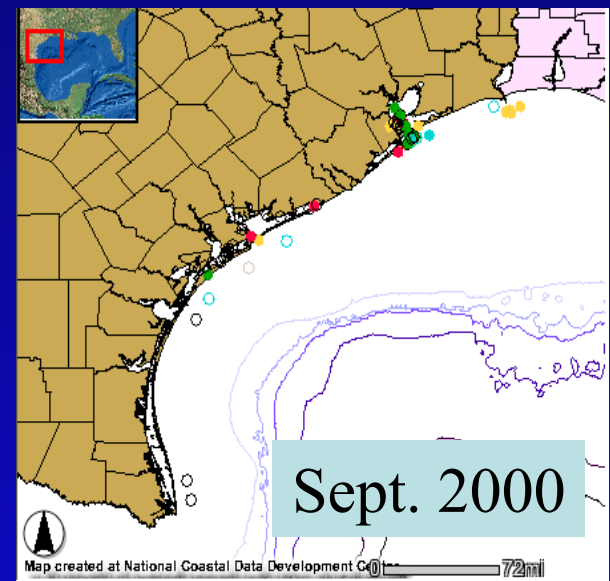
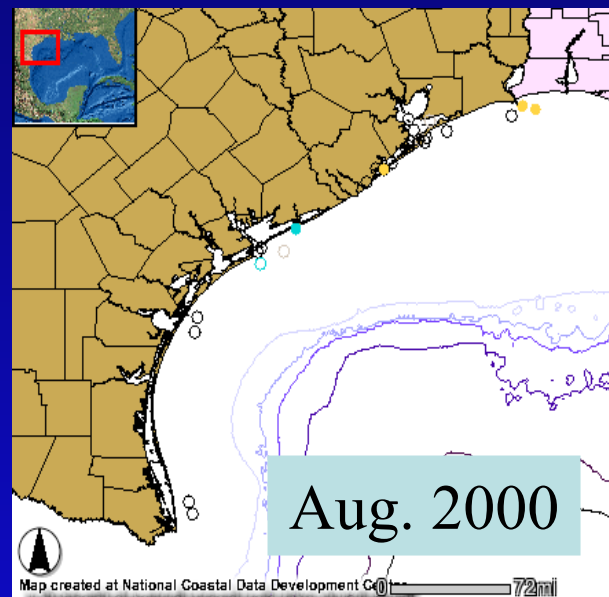
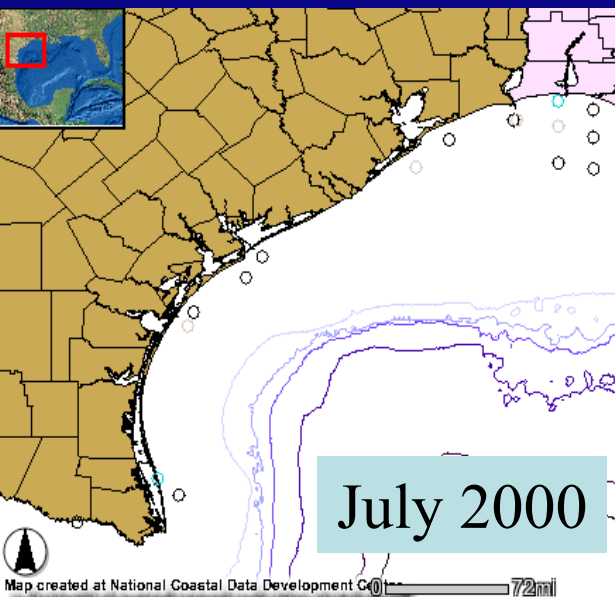
Prymnesium parvum



Prymnesium parvum



K. brevis - pilot program



Summary

- A variety of programs are currently collecting data along the Texas coast
- There is no long-term commitment to routine cell count collection
- Research programs of limited duration are providing the data
- Data presentation tools are available for rapid distribution and visualization